Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Risk of self-contamination among healthcare workers in the COVID-19 pandemic

To the Editor,

The SARS-CoV-2 pandemic presents a significant challenge for medical personnel. Since December 2019, when the first COVID-19 case was found in China, the incidence of the disease has grown to the size of a global pandemic. Currently 30,217,420 COVID-19 cases have been confirmed and the average mortality rate is around 3.1% (On September 18, 2020) [1]. The problem commonly raised in mass media is, apart from a large number of confirmed COVID-19 cases, the significant proportion of cases reported among healthcare workers (HCWs) [2]. The recent data provided by Centre of Evidence Based Medicine, estimate that up to 30% infections could be attributed to HCW, with up to 1% of the whole work force in health care sector being affected.

According to the American and European Centers for Disease Control and Prevention (CDC and ECDC) medical personnel should use full personal protective equipment when performing aerosol-generating procedures among suspected/confirmed COVID-19 patients. Increased precautions for patients during the SARS-CoV-2 pandemic are applied to minimize the risk of contamination The risk of such inadvertent contamination of skin and clothing despite the fact that the use of PPE could be particularly high during the removal of protective equipment. Therefore, the CDC provides guidelines for the proper sequences and techniques for both donning and doffing of personal protective equipment (PPE), and these are often reinforced during the training of hospital employees [3].

As described by Osei-Bonsu et al. medical stuff experienced self-contamination when doffing PPE with both a surrogate marker and live bacteria [4]. Another author describes that HCWs who were trained using the CDC procedures for doffing had lower rates of self-contamination than those without such training; however, the risk of contamination in the group that took part in the training was still 18.9% [5]. Given the high virulence of SARS-CoV-2, this presents an extremely dangerous situation. The problem of self-contamination may be even greater in the area of emergency medicine, especially Emergency Medical Service teams, where staff are dressed in level C suits, which require even more attention both when putting on and taking off. One of the solutions to reduce the risk of self-contamination is presented Casanova et al. and includes using double gloves [6,7]. It is based on the fact that a double-glove removal sequence would begin with removal of the outer glove, followed by removal of goggles or face shield, gown, and respirator/mask, and finishing with the removal of the inner glove followed by hand hygiene; handling of PPE with ungloved hands is avoided. Additionally, it is worth considering whether good glove hygiene with effective agents should not be implemented after taking off the outer pair of gloves before we start taking off the rest of PPE. The alternative strategy is recommended by ECDC, which includes using of a second pair of gloves during doffing. The use of double gloves in the case of highly infectious patients has one more additional advantage, as the research shows, reduces the risk of needlestick injuries during invasive procedures although a significant reduction of tactile perception, which is significant drawback needs to be mentioned [8]. Potential the drawback of double gloving could be a reduction of tactile perception, during the procedures requiring high dexterity, although it is not reported by previous surgical studies [8,9].

In summary, it can be assumed that self-contamination is a frequent problem associated with incorrect doffing procedures of PPE and likely contributes to the spread of viral infections. Close attention to doffing technique is necessary to avoid self-contamination, including the recommendation that after removal of pair of gloves and hand hygiene, the next pair of gloves is put on to continue doffing process. The creation of designated donning and doffing areas with clear rules for the disposal of used PPE reduces the risk of cross-contamination of surrounding surfaces.

Declaration of Competing Interest

Authors have no potential conflict of interest relevant to this article.

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